

I Claim:

1. A method for vapor phase deposition, which comprises:

vapor phase depositing components contained in a process gas flowing along a main flow direction onto at least one semiconductor substrate situated in a process space; and

during the step of vapor phase depositing, changing the main flow direction at least once.

2. The method according to claim 1, wherein the step of changing the main flow direction is performed by reversing the main flow direction.

3. The method according to claim 1, which further comprises: orienting the main flow direction parallel to an axis of symmetry of a plurality of semiconductor substrates in the process space.

4. The method according to claim 3, wherein the axis of symmetry is a rotation axis or a rotary mirror axis.

5. The method according to claim 1, which further comprises: at least partially removing the process gas from the process space before performing the step of changing the main flow direction.

6. The method according to claim 5, wherein the step of at least partially removing the process gas is achieved by performing at least one step selected from a group consisting of reducing a supply of the process gas into the process space, extracting the process gas from the process space, and flushing the process space with an inert gas.

7. The method according to claim 1, which further comprises: after performing the step of changing the main flow direction, providing the components with a different composition and/or a different concentration in relation to before performing the step of changing the main flow direction.

8. The method according to claim 1, wherein the components react chemically with the semiconductor substrate.

9. The method according to claim 1, which further comprises: performing the step of vapor phase depositing below atmospheric pressure.

10. The method according to claim 1, wherein the step of changing the main flow direction is performed in accordance with a variable time pattern.

11. The method according to claim 1, which further comprises:
while performing the step of vapor phase depositing, detecting
a quantity and/or a distribution of the components being
deposited onto the semiconductor substrate.

12. The method according to claim 1, which further comprises:
while performing the step of vapor phase depositing, detecting
a quantity and/or a distribution of the components being
deposited onto the semiconductor substrate while online.

13. A furnace for vapor phase depositing components contained
in a process gas onto at least one semiconductor substrate,
the furnace comprising:

a process space for receiving the semiconductor substrate;

a first feed/discharge line connected to said process space;

a second feed/discharge line connected to said process space;

a device for producing a process gas flow, said device for
producing said process gas flow connected to said first
feed/discharge line and/or said second feed/discharge line;

a heating device; and

a regulating unit for regulating a magnitude and a flow direction of said process gas flow.

14. The furnace according to claim 13, wherein said first feed/discharge line and/or said second feed/discharge line are configured at opposite sides of said process space.

15. The furnace according to claim 13, wherein said regulating unit is configured for changing a main flow direction of said process gas flow at intervals in accordance with a variable time pattern.

16. The furnace according to claim 13, further comprising: a measuring unit for detecting a quantity and/or a distribution of the components deposited onto the semiconductor substrate.

17. The furnace according to claim 16, further comprising: a control unit connected to said measuring unit, said control unit for an online control of said device for producing a process gas flow.